

ELM - EYE LIGHT MONITOR: ASSESSMENT IN A WORLD OF HYBRID VALUES

By

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ABSTRACT

This paper is a instrumental case study of an alternative assessment method, using a tool called ELM (Eye Light Monitor). ELM proposes a way to keep a finger on the pulse of every child, being attentive to emerging transitions in various parameters of his/her well-being that might affect his/her classroom behaviour and work, and might assist in identifying problems before they become a deeper problem. The case study presented in this paper presents a visual method of weekly communication between a teacher and his students along with a list of five to six criteria representing the student's wellbeing. The visual representation provides the teacher with an efficient method for identifying developing individual difficulties that requires intervention or general trends in classroom atmospheric changes.

Keywords: Assessment, Humanistic Education, Self-Evaluation, Teacher-Student Communication, Visualization

INTRODUCTION

How often do we hear the words "constructivism", "independent learner", "inquiry", "student centered"... in any teachers' lounge, educational faculty's corridors or administration board meetings? How often we watch children's eyes lightless as they come home back from school and we have a feeling that in spite of all the above words nothing has changed? Why is that? How come all these new understandings of children, their needs, learning, teaching and the role of education have not changed much?

This paper claims that there is an inner conflict, a double message coming in from "above" that confuses teachers, children and parents and stifles any attempt of implementing constructional modification of classroom learning. This conflict is between the 'vision' and the 'practical', between two types of interests that govern schools and classrooms: humanism and industrialism.

As one of the main carriers of this double message is assessment, this paper focuses on assessment in light of the above described conflict, and will propose a direction and a method for looking for the answers.

This case study discusses about an alternative assessment method, using a tool called ELM (Eye Light Monitor). ELM proposes a way to keep a finger on the pulse of every child, being attentive to emerging transitions in various

parameters of his/her wellbeing that might affect his/her classroom behaviour and work, and might assist in identifying problems before they become catastrophes.

1. Theoretical Background

While reading this background, the readers may question the relevance watching the dynamics of educational change from within the system, is being swayed by two conflicting approaches to education: the 'industrial' approach and the 'humanistic' approach.

The 'industrial' approach to education is a 'product oriented' approach. It looks at education through adapted industrial models that seek clear goals and clear 'deliverables', clear objectives and clear outcomes. That approach is usually demanded by administrators who need to show results, and is often demanded by parents who want to see results (The article will return to discuss the real meaning of these 'results').

The tools at the hand of these "outcomes seekers" are tests, standardized as much as possible, and marks mainly quantitative in their nature, by measuring the knowledge components of schoolwork. These are needed as comparative measures to compare between "before" and "after", so improvement is 'apparent'.

The 'humanistic' approach to education is 'student centered', trying to understand the student as a complete human being, claiming that learning should come from

within and not imposed by external systems. The humanistic approach looking at assessment as a dynamic is a two way process that its sole purpose is to provide constructive feedback to the learner and mentor to direct the next steps of learning. The humanistic approach to education looks at the child as the outcome, trying to guide him/her in the discovery of one's own self.

2. Grades and Marks - Destructive Energies

There are two destructive inner conflict embedded within conventional assessment methods like "marks" and "grades": The first is the struggle it creates between its function as a learning feedback tool vs. its function as a need for 'survival'. The second is the inner conflict between 'values' and 'desires' as it becomes a comparison tool among students.

2.1 Learning Feedback Vs. Survival

If we assume a student gets a high mark on an exam, for example, the feedback he gets on his learning of the subject matter is excellent - "you have done well; you know your material" (the evaluative powers of tests and exams are not discussed here as they are not important for the present study). But in the survival issues good grades are an important prerequisite for an increased number of potential life alternatives, good grades affect the student's wellbeing at home and in the class. Teachers and parents demand good grades; good grades have a huge impact on the student's social status and the student's self-image.

While discussing about the related questions 'Is there a problem? Why can't grades have various functions? Why is the conflict destructive?', the seriousness of the problem is explained as: Students see getting good grades as their highest goal, diminishing the first function of learning feedback. Recent research clearly identifies the negative effects that testing, marks, grades, gold stars, and prizes have on learning. Findings of this body of research demonstrate that using assessment for learning techniques in the classroom along with providing regular feedback to students through comments rather than marks improve students' performance even when

measured through standardized large scale achievement tests. Another very interesting finding is that providing feedback to students through comments along with a mark results in undermining the benefit of the comment as students ignore the comment when a mark is attached (Block & William 1998).

A whole line of research is devoted to show the destructive influence of external motivators on intrinsic motivation (Deci, Kostner and Ryan, 2001). This line of research claims that once external rewards are introduced (like "gold stars, best-student awards, honour roles, pizzas for reading...", p. 1) students lose their intrinsic motivation like interest and curiosity. Once external rewards are introduced, learners "work" for the reward itself and once the reward is awarded, learners will abandon the tasks they show interest in. Although in a previous meta-analysis (Deci, 1971) these findings are attacked by Cameron & Pierce (1994) claiming that results are minimal and largely inconsequential for making policy decisions. Deci et al's (2001) recent paper repeats Deci's initial findings and supports these with a vast meta-analysis study of 128 experiments. In a theory they call Cognitive Evaluation Theory, external events that influence the learner's perception of decreased competence and self-determination (like rewards) undermine intrinsic motivation. In other words, the more learning is controlled by external forces (like the teacher), the less self-determined a learner might perceive him/her self, the less intrinsic motivation will play a role in his/her learning.

2.2 'Values' Vs. 'Desires'

Rabi Akiva, (200 AD) one of the most influential leaders of Judaism, when he was asked to summarize the whole philosophy in one line (he was asked 'when standing on one foot') said: "Love your friend as you love yourself" (in free translation). We can find the same message in every religious philosophy; we embrace this value in every humanistic thought; we can find this message on classroom walls. On the other hand we use grades and marks to instill competing tendency than to instill love.

Grades and marks provide comparative measures between students' achievements. When a student comes

home, mother asks: "How did you do on your exam?" "I got 87" the student answers... "And how did Johnny do?" Comes the inevitable question. So what message a child can adopt 'love your friend' or get a 'higher mark'?

The desire to be the best, highlighted by expectations from home and society, enhanced by relative measures that place a learner in constant conflict between his intrinsic needs to learn (curiosity, interest, passion) and his need for immediate success. His need to succeed, when empowered by the need to be the best (better than others) is the source for this cognitive dissonance: 'I like my friend' but... 'I want him to be less successful than me'.

That dissonance can be resolved in two possible ways: Compromised value systems: 'It's ok to want others to be less than me', or compromised self image: 'I am not a person who can live up to my values... I surrender to my desires to be better'. Multiply this effect by 13 years (K-12) of 5 days a week, 5 hours a day of repeated message and with an unintended competitive culture.

So far, this paper has dealt with the distractive impact of grades and marks on moral development. The following section will give an overview of other values they serve.

3. Measuring Learning Outcomes

Many writers have pointed out how inadequate quantitative measures of achievements like tests and marks, are outcome based to humanistic education. To highlight the conflict between industrial and humanistic education in terms of assessment methods, it is clear to see the industrial interests which may lead towards quantitative measures, while humanistic interests need qualitative measures of students' performance.

How, can then learning outcomes be measured? How can we measure if learning has occurred? How can humanistic education attend to the needs of administration and show creditable, valid affect and improvement?

There have been many attempts to propose alternative assessment method for learning environments that focus on inquiry, on constructivist principles. Before proceeding to analyze some of the alternative assessment methods, the article needs to clarify some of the 'keywords' of

humanistic education: A simple way to look at these terms would be a hierarchical taxonomy (see Figure 1):

The proposed hierarchy could serve as a tool to identify internal causes of conflicts between educational beliefs and practical implementations leading to a shallow, trivialized practice or what can be called "The Triviality Principle".

4. The Triviality Principle

A definition of the Triviality Principle states that, "once philosophical vision are being transferred into a classroom implementation, only some components of the original vision are picked (those who can be defined or quantified), leading to a trivialized product that generally contradicts the nature of the original vision".

In his book "For Human Sake, Ways of Humanistic Education" (1998), Nimrod Aloni identifies two attributes to the major crisis he sees modern humanistic education is facing: Banalization of the humanistic ideology and nihilization of values. The Banalization of humanistic ideas is at the core cause of the triviality principle, but it's not sufficient. According to Aloni, the banalization of educational humanism stems from the interaction between the "high ratings" humanistic values carry in educational circles today and the superficial and confused nature of its concepts and meanings. While the author agree with Aloni that there is an inflation of ill-defined humanistic concepts in education, the author claims that while definitions and concepts tend to clarify with age, the main problem lies in the interaction between

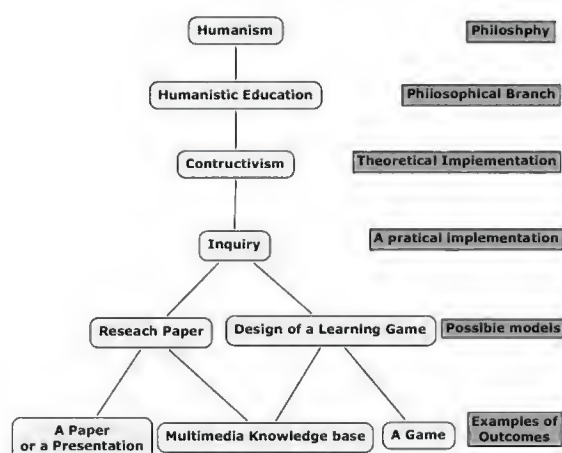


Figure 1. Taxonomy of Recent Educational Trends

immaturity of concepts and a growing need for implementation. The need for implementation is growing with the realization of the crumbling of conventional education. The growing realization is that the school is not what is used to be in real. Increased ignorance, failure and violence cause a crisis of trust between the public and the schools. The pressure for new approaches, new methods and new answers is affecting all of us. The need for immediate answers causes superficiality as we tend to identify the necessary keywords for every new grant proposal and implement them into our new models without the realization that mixing humanistic values with conventional, mostly behaviouristic, classroom practices creates a double message that is, sometimes, more harmful than beneficial: When a child is getting a message of 'be responsible for your own learning' with a 'get your parents to sign the mark on your last exam' he is confused. The hidden-conflicts of these messages will be highlighted in the following sections.

To further explain the Triviality Principle, we recruit Lev Landa (1974, 1976), who explains in his books the difference between two types of problems: Heuristic and Algorithmic. The Algorithmic type of a problem is a problem with a finite and defined set of solutions. Solving an algorithmic type problem is a process in which the alternative solutions are compared one by one, with a profile of an ideal outcome. A Heuristic type of a problem does not have a finite or defined set of solutions so the process of attempting to solve it is less structured and requires tools like intuition, tendencies, etc.

As the author shows in his doctoral dissertation work (1987), when presented with a Heuristic type of a problem (when human beings are concerned with most problems, are of heuristic nature), many implementation models of instructional design force an Algorithmic type of a model on the problem, hence "stripping it of its soul".

An example of the Triviality Principle at work is Papert's (1980) 'Logo'. In his book "Mindstorms" Papert presents an uplifting approach to learning, a vision that had captured many educators with new hopes. The implemented result was a programming language (Logo) that had been taught as a programming language, losing most of

Logo's vision of a child's inquiry in his own 'Microworlds'.

4.1 The Triviality Principle and Conventional Assessment

The Triviality Principle works overtime when it comes to current trends of "Constructivism" and "Inquiry Based Learning". The terms that are being frequently used with reference to the Constructivist Classroom are "learner-centered", "learner's responsibility", "learner controlled"... (Tishman, Perkins, Jay, 1995). Looking at an average classroom we can find the ideas of 'learner-centeredness' being widely stated, but is it really learner-centered? Can learning be 'learner centered' in a classroom in which the teacher does assessment through tests and exams, manages learning schedule, assigns grades, imposes curriculum?

When measuring internal integrity of an educational practice, we need to evaluate its principles along the guidelines of the original vision that initiated it. If we want to build a "constructivist classroom", we need to make sure that our practices are within the boundaries of "humanistic education" (see Figure 1) as we cannot expect a "humanistic education" approach to be outside the realms of "humanism" altogether.

If the logic of the above explanation is accepted so far, let's look at the relationship between conventional assessment tools and the constructivism-based learning environment. For example:

The tie between 'constructivism' and 'collaboration' is intrinsic as constructivism stems from the works of Vygotsky's Socio-cultural Theory that relates cognitive gain through interpersonal and intra-personal processes. Sherman (1995) presents her interpretation of constructivist learning environment as collaborative work amongst students, teachers and experts. Any probe into the idea of constructivism (even a simple Google search) will retrieve countless articles tying between constructivism and collaboration.

While examining conventional assessment tools, the grade itself is fostering competition. It doesn't need to be, but it's the mere nature of a relative measurement instrument and the way grades are stressed as major means of achievement, makes the grade into a

competitive tool at the hands of students, teachers and parents. Is there a room for competitive tools in a constructivist learning environment?

If conventional assessment tools are becoming irrelevant to new trends in humanistic education, what other tools can serve to assess student performance? Is assessment a part of humanistic learning environment? How can we satisfy the needs of administration for some form of comparable outcomes?

In order to diminish the effects of the triviality principle, assessment method should be examined along the following questions:

- How suitable is the method to the values of humanistic education?
- How feasible is the method for everyday classroom implementation?
- How attentive is the method to the needs of administration?
- How helpful is the method in providing relevant information of learning processes?

The following is a presentation of another concept of assessment. It attempts to suggest a practice that is suitable to the nature of humanistic, constructivist-based learning environment.

5. Eye-Light Monitor (ELM) An Alternative Assessment Method in the Humanistic Education Classroom

"Humanists also believe that it is necessary to study the person as a whole, especially as an individual grows and develops over the lifespan. The study of self motivation and goal-setting are also areas of special interest" (Huit, 2001).

The teacher's role in a constructivist learning environment is shifting from the knowledge source into the role of a mentor, a guide (Cornu and Peters 2005). One of the most important functions of a mentor (teacher, supervisor, advisor...) is the identification of changing patterns in the student's attitude as early as possible, so that intervention will be as effective as it can be. ELM is an aid to the student to examine daily states of mind and report them in a summarized, visualized form to the mentor that can

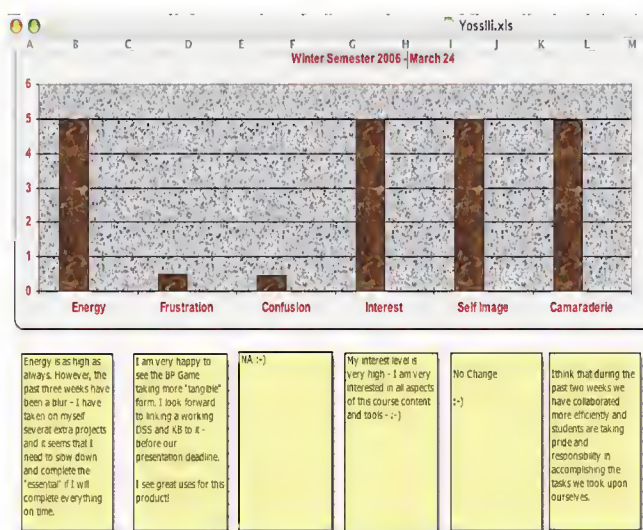
notice shift patterns at a glance.

So far, the article has discussed the need for a new approach to assessment that will be more synchronized with our educational beliefs and values. Pointing at the attempts of educational systems to "humanize" their learning environments and assessment as it fosters conflicting values to humanistic values (as in the example of collaboration vs. competition), thus 'cutting off the branch we are sitting on'.

The remaining parts of this article will present an alternative tool that has been deployed in eight of the writer's teachers training classes and graduate education courses. This article presents a case study to introduce the method and the tool.

Before describing the mechanism of the method and its rationale, here is a weekly profile as taken from Yossi's (a student) ELM Journal for the week of March 24, 2006 of a "Computer in Learning" graduate level course (See Figure 2).

This weekly ELM profile shows that Yossi is at his peak of his perceived "learning state". His energy level is at maximum, his interest level is the highest, he feels good about himself and his group. Yossi's confusion and frustration levels are minimal, and considering the complex tasks the class is involved with, that is important to know.



This is a real data point that was taken from Yossi's file.
Figure 2. A Weekly ELM Profile

A quick look at the Graph which shows the instructor that Yossi does not need the instructor's immediate attention. ELM is a "finger on the student's pulse".

6. Rational

6.1 Holistic Awareness

The need for a daily input of every student performance is clear, and for the teachers, as mentors (a basic concept of constructivism), it is reached to understand what is happening to our students and identify the energies that facilitate (or block) their "learning state" or well-being. It is needed to see how comfortable they are with their content, how engaged and energized they are and, most importantly, how ready they are to take on responsibility over their own learning and social processes.

Teachers need to see when they are "losing" some of the students, either because they are not engaged or because they don't understand the content. For the students, a daily reflection practice is needed for self-awareness. Self-awareness is a holistic term pertaining to the student's overall "state-of-mind".

While conventional assessment methods attempt to measure the "knowledge component", their potential of providing meaningful information for effective intervention is limited. If we see a child failing a math test, how can we isolate the reasons? Is it because of his math background, or his attitude to math, or his attitude towards himself as a learner, or, may be it's just because he has been having a lot of problems at home? Holistic measurements provide us with a link to the student as a human being.

This approach to assessment assumes a multi-role for ELM as an assessment tool:

- Provides information about the student
- Serves as a means of self-awareness for the student
- Provides a human link between the student and the teacher that is based on a holistic view of the student as a person, setting up the atmosphere for a more human oriented learning environment.
- Provides the teachers with an indication of developing group trends that they should attend to, like

loss of interest, boredom, developing frustrations, etc.

6.2 A Note about Self Assessment

A general concern that requires attention is the issue of self-assessment. Are students going to be honest and open to report real issues about themselves? Black and William (1998) addressed this issue in their survey and reported that students are generally honest and reliable although sometimes too harsh about themselves. It is believed that due to the fact that the ELM is detached from any "survival" attributes of assessment (it has nothing to do with grades and marks, or doesn't hold any social weight), the student will report what they really feel. A cross cultural research is needed to measure for cultural differences and will be discussed in the discussion section.

7. Yossi as a Case Study

7.1 Methodology

Before we unleash ELM and examine its potential as an assessment tool in a research of a larger scale, we needed a deeper understanding into the dynamics of the tool and the method. We picked the Case Study methodology for the initial study and focused on one student - Yossi.

We come to the research with the following questions:

- Is it feasible? Will Yossi keep reporting every week, using the tool?
- Is it providing reliable information? Will Yossi be honest and open?
- Is it providing insight into Yossi's learning process?
- Can it replace other means of assessment? Will it provide enough data for the author to feel ethically safe with Yossi's mark?

7.2 The Procedure

ELM has been introduced in a graduate level, computer based learning, two-semester course at the Faculty of Education, University of Calgary during the 2005-2006 academic year. The students were asked to use the ELM tool and e-mail the results to the instructor every week. They were instructed to record any change they sense and annotate it. The ELM Microsoft Excel Workbook and a user's guide were made available for students'

CASE STUDY

downloads.

The author, while receiving the students' graphs, quickly scanned the profile to identify the needs for his intervention and responded accordingly. Showing active interest in the method, Yossi was offered by the author to serve as a case study and a co-writer of this paper. There is no attempt to generalize the findings of this experience. This is only an attempt to better understand the ELM method.

7.3 The ELM Tool

The ELM tool is an Excel workbook template with 6 proposed criteria presented in Figure 3 as a bar chart with text boxes below each bar for annotation. The criteria are presented on the chart, but the students are encouraged to replace or add criteria. The workbook includes a tab for every week during the semester, so the students are asked to use the same file, recording their reflective experiences on the appropriate tab.

Five colorful bars (one for each day of the week) are available for each criterion.

The manipulation of the bar (pulling it up or down) changes its value on the data table.

7.4 Data Collection

The tools that were selected triangulate information from various resources to increase the validity and reliability of the results:

- ELM data: Each of Yossi's profiles (every week) is collected and observed.

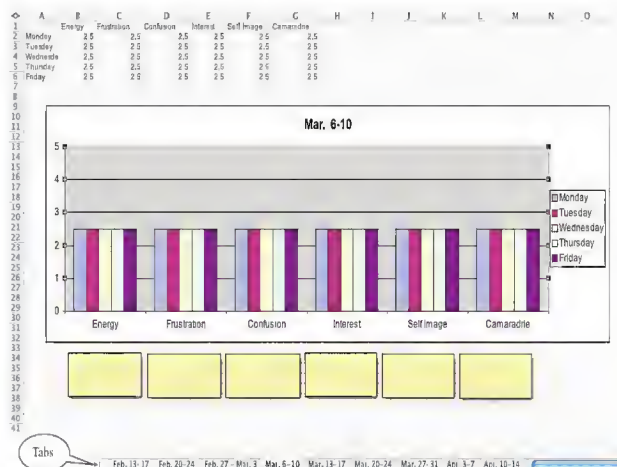


Figure 3. The ELM Template

- Yossi social placement in the class as observed by his role as a resource and support person in technology, his leadership skills in organizing the class projects, his contributions to the class' discussion board, etc.
- Yossi's products (class presentations, investment in the class' project, writings, etc.) are observed.
- A general sense of Yossi's well-being as observed by this instructor.

7.5 Results

Figure 2 presents Yossi's ELM in the 8th week of the second semester of the course. It's a perfect profile. Has always things been so well? Is Yossi such a model student? Is he facing any difficulties or problems? Is he being honest?.

Another ELM from the 6th week of the first semester of this year-long course is presented in Figure 4. Here we see that although Yossi has a high level of energy and interest, his confusion and thus his frustration levels are quite high. The levels are not high enough to influence his self-image level (it is still very high), but the complexity of the topic ("Theory of Need"), keeps him puzzled.

The ELM is a graph on which the students report their weekly profile, based on a set of agreed upon criteria that each student negotiated with the instructor at the beginning of the semester.

Each week, the student records his status, annotates and e-mails the graph to the instructor. The instructor gets the profile from all the students, identifies common problems and attends potential disasters as they begin to emerge.

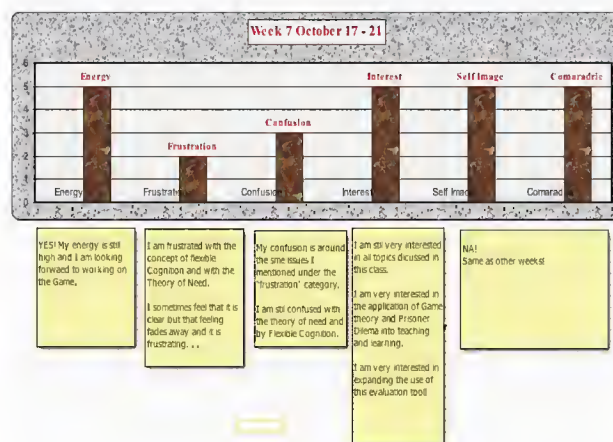


Figure 4. Another look at Yossi's ELM from a previous semester

CASE STUDY

Problems could be identified as individual problems or common problems. Individual problems might occur due to lack of energy, too much pressure, confusion, lack of interest or a problematic social situation. Not all individual problems are classroom related, and not all of them can be treated. The authors strategy as an instructor is to e-mail the student who shows a need, ask if the instructor assistance is needed and invite the student for a personal meeting if he feels a need for it.

Common problems become apparent when a change is himself, his teaching, his methods, the classroom atmosphere, etc. One criterion or more is observed across several students. In that case the instructor examines himself, his teaching, his methods, the classroom atmosphere, etc. Finally, Yossi's assessment of the end of the first and second semester are presented in Figures 5 and 6.

Other qualitative observations that help to assess the reliability of ELM as a measure for Yossi's wellbeing as a student are:

1. Yossi's social placement in the class:

Yossi is a technology specialist in his school. With his vast background in the use of technology in his school, he has become the course's main technology resource. With his unconditional willing to help others he became a focus of attention and appreciation. He used his leadership skills in organizing the class projects. Yossi's ideas and leadership was accepted by the group and placed him as an

invaluable member. His contributions to the class discussion board included resources, comments and ideas that were well accepted by his peers.

2. Yossi's products (class presentations, investment in the class' project, writings, etc.):

Without the use of conventional assessment of Yossi's products, the class very well accepted them. Yossi has invested much work in his products, presented and shared them with passion.

3. A general sense of Yossi's wellbeing as observed by this instructor:

Yossi has been a model student. He demonstrated a steady level of high engagement throughout the course. His self-assigned grade was well deserved. A meaningful indication of the effect of ELM on Yossi is the fact that he had adapted the method and has been using it with his own son at home and with his students in his classroom. Yossi has become a partner in the future development of ELM and considered it as a topic of his doctoral dissertation.

8. Discussion

The questions that were presented before in this study had to do with two types of information: The roles of ELM and its

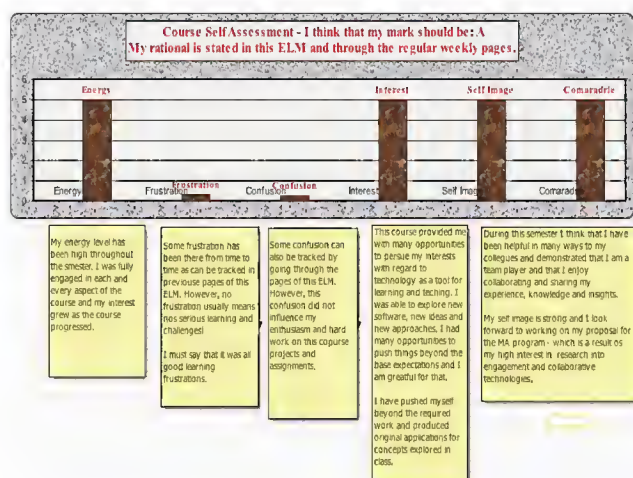


Figure 5. Yossi's Self Assessment for the First Semester

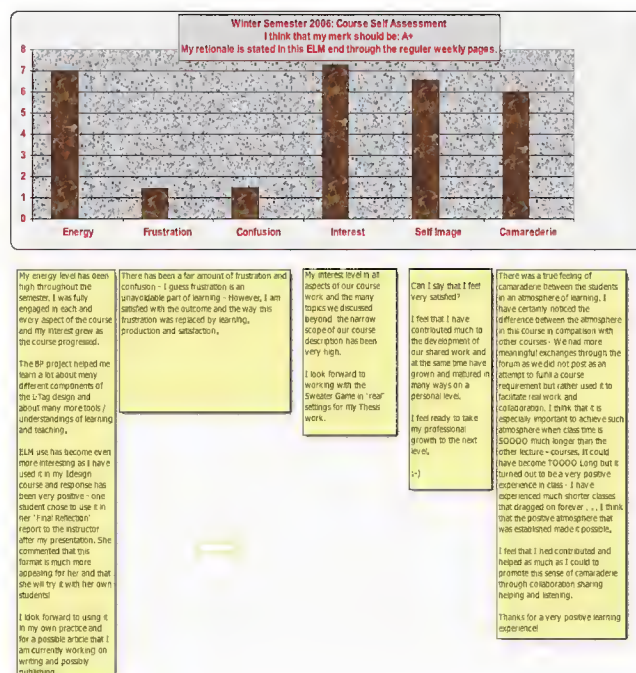


Figure 6. Yossi's Self Assessment for the Second Semester

functionality.

8.1 The roles of ELM:

a) Provides information about the student:

ELM provides a steady inflow of valuable information in real time (almost) about the students, using a set of criteria that is negotiated between the student and the teacher and can be modified throughout the course. Any change in the status of the student is immediately apparent and can be attended before becoming a more serious problem.

b) Serves as means of self-awareness for the student: As we can see from Yassi's comments on his ELM, he has been using it as a guided reflection tool, probing deeply and constantly into his situation in the course.

c) Provides a human link between the student and the teacher that is based on a holistic view of the student as a person, setting up the atmosphere for a more human oriented learning environment.

As a teacher, this writer felt that he has his finger on the pulse of every student in the class. ELM provided an opportunity for a one-to-one relationship with the students, based on authentic situations. The teacher was able to identify specific needs and approach them on an individual channel with the student using either e-mail or personal meetings.

d) Provides the teachers with an indication of developing group trends that they should attend to, like loss of interest, boredom, developing frustrations, etc.

Many-a-time this instructor had to re-evaluate his teaching methods and clarify the material and ideas he has presented in the class. The need for change was easily observed with a drop in interest, energy or the rise of frustration and confusion level. ELM provided a sensitive measure into the class dynamics.

8.2 ELM Functionality

1. Is it feasible? Will Yassi keep reporting every week, using the tool?

ELM has been very feasible. Yassi has been reporting every week throughout the year.

2. Is it providing reliable information? Will Yassi be honest

and open?

Triangulated with the other measures reported, it seems that Yassi has been honest about potential problems and reported them in time, helping this instructor to attend them in time.

3. Is it providing insight into Yassi's learning process?

Although some assumption could be made, and in some ways ELM helped identifying some of the processes, more research is needed on this issue.

4. Can it replace other means of assessment? Will it provide enough data for the instructor to feel ethically safe with Yassi's mark?

This instructor is a hopeless humanist. As such he found this method to be very suitable to his own values of formative assessment. ELM and the other criteria used by Yassi in his self-evaluation provide this author with a sound ethical foundation for his mark assignment.

Is ELM standing up to the challenges present in the introduction of the article?

Why don't you, the reader, be the judge of that?

Conclusion

ELM is in its initial state, where more research is needed to examine issues like cultural differences: Will ELM be more effective in cultures that are more open to the expression of internal processes, feelings, relationships, etc? A deep research into individual differences is needed, with different age groups.

A considerable issue is the way how teachers would accept ELM that presents a mirror image of their own teaching. Will teachers be willing to adapt their teaching style and course flow to the needs presented by ELM?

At the organizational level will systems be ready to examine such an alternative to conventional assessment?

This article opens up a long and exciting path for a quest into the conflicts between values and practice, a quest into facing the triviality principle and diminishing it.

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